A NEW ARCHIBENTHAL SPECIES OF FASCIOLARIIDAE FROM NEW ZEALAND

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Plate 1

SUMMARY

A new species, provisionally placed in the New Zealand Palaeocene genus *Microfulgur* Finlay and Marwick, is described from 730 metres off the Otago coast, South Island, New Zealand. The radula, operculum, shell features and the gross morphology of the animal are described. *Microfulgur* has been previously placed in the Galeodidae but, on the radula characters of the Recent species, is transferred to the Fasciolariidae.

INTRODUCTION

Under the supervision of Dr. E. J. Batham, the R. V. *Munida* has obtained many interesting molluscs while working off the Eastern Otago coast of New Zealand. Dr. Batham has kindly allowed the writer to describe the following new species which does not appear to have any other Recent Australasian relatives.

Of the four specimens obtained from the type locality, three were collected alive and preserved in alcohol. The fourth, a dead shell, is the only specimen with a mature aperture. Two specimens were dissected and brief anatomical notes are given below. The material examined is housed in the Dominion Museum, Wellington, except for one paratype which is located in the Australian Museum, reg. no. C 71221.

DESCRIPTION

Genus *Microfulgur* Finlay and Marwick, 1937:73.

Type Species (o.d.): *Latirus (Mazzalina) longirostris* Marshall.

Microfulgur (?) carinatus sp. nov.

Plate 1, Figs. 1-4.

Shell: Medium size, rather thin, fusiform with spiral cords. Whorls $5\frac{1}{2}$, including a slightly swollen protoconch of $1\frac{1}{2}$ whorls, smooth except for 3-4 weak axial ribs on last whorl, terminated by a distinct varix. Teleoconch with convex whorls, subangled in middle of each whorl by uppermost of two strong, rounded spiral cords on lower half of all whorls. Shoulder almost flat, with weak spirals (4-5 on body whorl), these stronger as they approach the periphery. In a small (male) paratype the lowest shoulder spiral is nearly equal in strength to the upper main spiral. A rather weak cord emerges from the suture on the penultimate whorl. Base with numerous, rather weak, spiral cords (about 36 in holotype); the uppermost 1-2 basal spirals nearly equal in strength to the two main spirals. Axial sculpture of fine, dense growth lines, slightly and evenly curved corresponding to the weak apertural sinus. Whole

surface covered with very fine, dense, irregular spiral striæ. Outer lip with a slight posterior concavity a little below suture, thin (in the one paratype which appears to be mature), with a little external thickening but no varix. Inner lip a thin glaze with a distinct boundary. There is no apertural ornament. Anterior canal long, initially nearly straight, then twisted to the right and behind. Anterior end of canal notched.

Operculum: Thin, semi-transparent, yellowish-brown, with distinct growth lines and sub-apical nucleus (Fig. 4).

Radula: Ribbon 3 mm long, with wide lateral teeth and small central teeth. Lateral teeth curved, each with 9 cusps, the inner and outermost cusps small, the remainder large, heavy, and curved slightly inwards. There is a short, blunt projection on outer end of each lateral tooth. Central teeth rather weakly developed, less thickened than lateral teeth. Each central tooth with 3 short, sharp cusps, frequently broken off, the median cusp slightly larger. Base barely distinguishable from radular membrane (Fig. 3; slide housed in the Australian Museum.)

Head-foot: Rather small, unpigmented. A pair of broad, short (contracted) cephalic tentacles lie close together with the eyes at their outer bases.

Anatomy: (Preservation rather poor.) Mantle cavity normal buccinacean. Osphradium large, broad, brown, bipectinate. Ctenidium normal, a little narrower than the osphradium. Hypobranchial gland appears to be well-developed. Male with large, broad penis 3.2mm long, lying transversally across right side of body at opening to mantle cavity; attached near base of right cephalic tentacle. Ejaculatory duct muscular, slightly convoluted and opens into the straight, narrow pallial sperm duct on the right side of the mantle cavity. There is apparently no distinct prostate gland. Pallial oviduct massive, occupying all of the right pallial wall in the female; appears to be typically " buccinid " in structure (Fretter, 1941), but no ingesting gland could be distinguished. This was apparently not due to the poor preservation of the specimen as all of the other structures in the pallial genital duct could be located. The specimen may not have been sexually mature, although the size of the capsule gland suggested that it was. There is no anal gland.

Salivary glands large, compact, white, paired; situated immediately behind head. They surround the proboscis sheath laterally and ventrally. Gland of Leiblein on left, behind and outside left salivary gland. This gland is relatively much larger than in *Buccinum* (Dakin, 1912) but is of similar structure. The proboscis sheath extends to end of cephalic cavity, its distal half swollen and thin-walled except for the extreme posterior end. A powerful retractor muscle, accompanied by a weaker one, is attached to proximal end of proboscis sheath and extends posteriorly on right to become embedded in columellar muscle near end of cephalic cavity. Proximal part of proboscis sheath narrow and rather muscular. Retracted proboscis muscular, wide at base, tapers evenly and ends about half way along proboscis sheath. Buccal mass lies within whole of non-inverted portion; odontophore rather weak, elongate, the radular sac extending along its entire length. Buccal cavity muscular, opening into a muscular anterior oesophagus which lies, for most of its length, on the ventral side of proboscis sheath. Valve of Leiblein about twice width of œsophagus. Mid-œsophagus short, not noticeably glandular. Posterior

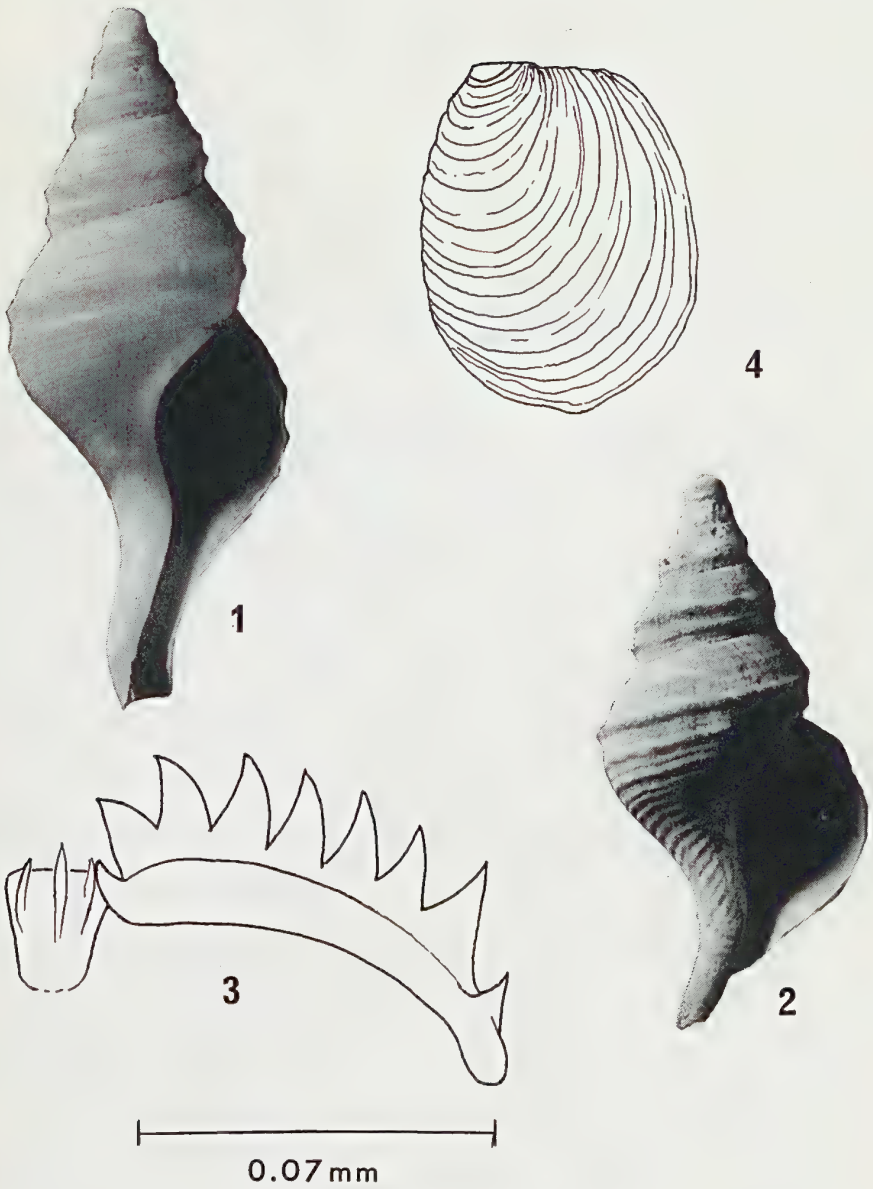

PLATE 1

Figures 1 - 4. *Microfulgur (?) carinatus* sp. nov. 1, holotype. 2, paratype. 3, radula of paratype. 4, operculum of paratype (3.4mm x 4.6mm).

œsophagus straight, not forming a crop. Stomach elongate, tubular, without a cæcum. Nervous system not examined.

Type material:

	Height	Diameter	
Holotype M23204	25.0mm	9.6mm	Female (Fig. 1)
Paratypes M23205	19.5mm	9.0mm	A dead shell with outer lip mature. (Fig. 2)
	20.0mm	8.0mm	Male.

Locality: Portobello R. V. *Munida* station Mu 67-142; 171°02'E, 45°51'S, 730 metres in Papanui Canyon, Otago coast, New Zealand (4 specimens).

An additional specimen was obtained from Mu 68-27; 171°08'-07'E, 45°38'S, 720-540 metres in Karitane Canyon off the Otago coast (Portobello Marine Station reference collection).

DISCUSSION

The generic placement of this species has proved difficult. *Microfulgur* Finlay and Marwick is a monotypic genus in the Palæocene of New Zealand which agrees fairly closely in protoconch and teleconch features but differs from *carinatus* in some respects. For example, although the anterior canal is similar, it is less curved than in the Recent species. The protoconch of all specimens of the type species, *Microfulgur longirostris* (Marshall) is worn or missing, although as far as can be judged it appears to be similar to that of *carinatus* except that it is relatively smaller. The spire in *longirostris* is much more depressed and evenly conical in outline than in the Recent species and the spiral chords are narrower and sharply raised. Finlay and Marwick state that the columella bears a weak fold and groove where "it is bent to the canal". This feature is not visible in *carinatus*. Examination of topotypes of *longirostris* shows that Finlay and Marwick exaggerated the extent of the fold, this being hardly visible, and there is no idication of a groove.

Another similar species is *Lirofusus thoracicus* (Conrad) from the Eocene of Alabama. This species, however, has stronger axial sculpture and a protoconch of three whorls. There do not appear to be any other closely allied forms.

Possibly the erection of a new genus or sub-genus for *carinatus* will be required eventually, but as a full scale revision of the "buccinacean" genera is long overdue, a tentative placement in *Microfulgur* is preferred to encumbering the literature with yet another monotypic genus—group name. The new species can be regarded as a *Microfulgur* which has lost the weak columellar ornament and has developed a more elongate spire than its Palæocene ancestor. There do not appear to be any connecting forms known in the New Zealand Tertiary.

The shell of *carinatus* somewhat resembles the Antarctic genera *Proneptunea* Thiele and *Prosipho* Thiele but differs from both of these in its longer canal and in radular characters.

Finlay and Marwick place *Microfulgur* in the "Busyconidæ" (= Galeodidæ) but the original placement of *longirostris* in the Fasciolariidae by Marshall appears to be correct judging by the radular features of the

Recent form and the ornament on the lower columellar of the fossil species. Most fasciolariids have an orange or red head-foot but the preserved specimens of this species were unpigmented. It is unlikely that alcohol bleaching removed all traces of pigmentation as this does not occur completely in other species. The internal anatomy shows that the new species belongs to the Buccinidæ — Nassariidæ — Galeodidæ — Fasciolariidæ complex (= Thiele's (1929) Buccinacea). Unfortunately there are no reliable anatomical differences that readily distinguish these families.

This case proves to be an informative illustration of the resemblance of shell (as well as anatomical) features between the families of the Buccinacea. With this one example, the Buccinidæ, the Galeodidæ and the Fasciolariidæ come very close together on shell features and the final determination of familial position could only be made by a study of the radula.

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